

FIGURE 1

| UNIT PRICE CATALOG | | | | | MASTER [BASELINE] RCM | | |
|---|---|--|--------------------------------------|------|-----------------------|-------|--------|
| 002 Project Planning & Management, Inc. | | | | | Berrien City, MI | | |
| | | | | | Cost Adjustments | | |
| System | Description | Ave Sub Base Unit Cost | Gen'l Conditions: Adjusted Unit Cost | Unit | Loc_Fctr | S_Tax | Sub_GC |
| col_sprd_ftg | 3000 PSI concrete | | | | | | |
| 1 | forms, rebar, concr, placing, finish | \$204.00 | \$201.35 | CY | 0.94 | 3% | 2% |
| sprd_ftg | 3000 PSI concrete | | | | | | |
| 1 | Not Req'd (Trench Footing) | \$0.00 | \$0.00 | LF | | | |
| 2 | 12" thick x 18" wide; forms, reinf, direct chute | \$12.06 | \$11.90 | LF | 0.94 | 3% | 2% |
| 3 | 12" thick x 24" wide; forms, reinf, direct chute | \$13.71 | \$13.53 | LF | 0.94 | 3% | 2% |
| 4 | (For Precast Foundations) 12" thick x 24" wide; 3/4" stone bedding | \$2.22 | \$2.19 | LF | 0.94 | 3% | 2% |
| fdn_drain | | | | | | | |
| 1 | PVC 4" dia; gravel drain bed | \$4.00 | \$3.95 | LF | 0.94 | 3% | 2% |
| 2 | PVC 6" dia; gravel drain bed | \$5.00 | \$4.94 | LF | 0.94 | 3% | 2% |
| fdn_wall | 4' high foundation wall | | | | | | |
| | | (deduct of 4*\$0.70 eliminates 1" rigid Insul) | | | | | |
| 1 | Poured-8"; bitum/damp; sill plates | \$20.44 | \$20.17 | LF | 0.94 | 3% | 2% |
| 2 | Poured-10"; bitum/damp; sill plates | \$23.60 | \$23.29 | LF | 0.94 | 3% | 2% |
| 3 | Poured-10"; brickledge; bitum/damp; sill plates | \$31.16 | \$30.75 | LF | 0.94 | 3% | 2% |
| 4 | Poured-12"; bitum/damp; sill plates | \$26.08 | \$25.74 | LF | 0.94 | 3% | 2% |
| 5 | Poured-12"; brickledge; bitum/damp; sill plates | \$33.64 | \$33.20 | LF | 0.94 | 3% | 2% |
| 6 | Block-8", grouted; bitum/damp; parging; sill plates | \$37.84 | \$37.35 | LF | 0.94 | 3% | 2% |
| 7 | Block-10", grouted; bitum/damp; parging; sill plates | \$42.44 | \$41.89 | LF | 0.94 | 3% | 2% |
| 8 | Block-12", grouted; brickledge; parging; bitum/damp; sill plates | \$47.28 | \$46.67 | LF | 0.94 | 3% | 2% |
| 9 | Pre-Cast Wall System, bitum/damp; sill plates | \$22.80 | \$22.50 | LF | 0.94 | 3% | 2% |
| 10 | ICF (Insulated Concrete Foundation); sill plates | \$32.70 | \$32.28 | LF | 0.94 | 3% | 2% |
| 11 | Trench footing/grade beam; 12" poured/reinf; earth formed; no insul | \$21.76 | \$21.48 | LF | 0.94 | 3% | 2% |
| 12 | Wood 2x8; 16"OC; CDX sheathing; vapor; 9" Insul R-30 | \$24.04 | \$23.73 | LF | 0.94 | 3% | 2% |

FIGURE 2

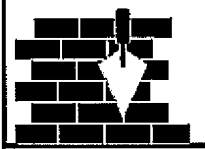

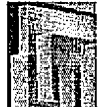

| SECTION 7: BUILDING SYSTEMS | | | |
|---|--|--|--|
|  | <p><i>This final section will explore and document your quality expectations for various building systems in your new home. These decisions are important as they will directly affect the construction budget. In addition, building envelope selections (walls, roof, windows, insulation) will also impact energy heat loss calculations.</i></p> | | |
| 01 Foundation | | | |
| 011 Standard Foundations <div style="display: flex; justify-content: space-between;"> <input type="checkbox"/> Sand/Gravel Soil <input type="checkbox"/> Sand/Clay Soil <input type="checkbox"/> Problem Soils (e.g., water; low soil bearing capacity) </div> | | | |
| 02 Substructure | | | |
| 021 Slab on Grade <div style="display: flex; justify-content: space-between;"> <input type="checkbox"/> 4" thick (standard) <input type="checkbox"/> 5" thick <input type="checkbox"/> 6" thick </div> | | | |
| 022 Excavation: Basement <div style="display: flex; justify-content: space-between;"> <input type="checkbox"/> No Basement <input type="checkbox"/> Crawlspace </div> | | | |
| <div style="display: flex; justify-content: space-between;"> <input type="checkbox"/> Full Basement <input type="checkbox"/> Partial Bsmt (some of Ground Floor living area on slab) </div> | | | |
| 023 Basement Walls <div style="display: flex; justify-content: space-between;"> Wall Material <input type="checkbox"/> Poured concrete <input type="checkbox"/> Concrete block/parging <input type="checkbox"/> Wood foundation </div> | | | |
| <div style="display: flex; justify-content: space-between;"> <input type="checkbox"/> "Superior" Precast Foundation Wall System w/1" insulation </div> | | | |
| <div style="display: flex; justify-content: space-between;"> Waterproofing <input type="checkbox"/> Standard Protection <input type="checkbox"/> Premium Protection </div> | | | |
| <div style="display: flex; justify-content: space-between;"> Insulation <input type="checkbox"/> None <input type="checkbox"/> 1" Rigid (R-5) <input type="checkbox"/> 2" Rigid (R-10) <input type="checkbox"/> 3" Rigid (R-15)* (recommended) *Energy Star </div> | | | |
| 03 Superstructure | | | |
| 031 Floor Construction <p>NOTE: Priced from least to most expensive per SF of floor system (left to right)</p> <div style="display: flex; justify-content: space-between;"> <div style="width: 30%;"> 1 Composition "I" Joists (Standard spans to 24') * 1" x 3" Ceiling furring not required  </div> <div style="width: 30%;"> 2 Dimension lumber (e.g. 2x12) (Standard spans to 19') * Material readily available  </div> <div style="width: 30%;"> 3 Truss Joists (Standard spans to 24') * Utilities easily pass through  </div> </div> | | | |
| 032 Roof Construction <div style="display: flex; justify-content: space-between;"> <div style="width: 30%;"> House <input type="checkbox"/> SIP / Timber Frame Garage <input type="checkbox"/> SIP / Glu Lam Ridge Beam Dormers <input type="checkbox"/> SIP SIP Thickness <input type="checkbox"/> SIP Not Used <input type="checkbox"/> 4.5" OSB/OSB (R-18) SIP Interior Finish <input type="checkbox"/> 1/2" Gypsum Board </div> <div style="width: 30%;"> <input type="checkbox"/> Prefab trusses <input type="checkbox"/> Prefab trusses <input type="checkbox"/> Dimensional lumber (e.g. 2x8) <input type="checkbox"/> 8.25" OSB/OSB (R-34) <input type="checkbox"/> 6.5" OSB/OSB (R-27) <input type="checkbox"/> Tongue & Groove "T&G" (pine or cedar) </div> <div style="width: 30%;"> <input type="checkbox"/> Dimensional lumber (e.g. 2x10) <input type="checkbox"/> Dimensional lumber (e.g. 2x10) <input type="checkbox"/> 10.25" OSB/OSB (R-42) <input type="checkbox"/> 12.25" OSB/OSB (R-45) </div> </div> | | | |
| 033 Stair Construction <div style="display: flex; justify-content: space-between;"> <div style="width: 30%;"> Basement Stair <input type="checkbox"/> Basement stairs, open riser Ground Floor Stair <input type="checkbox"/> Pine treads / risers (pine), box stairs, balusters/handrail, newel post <input type="checkbox"/> Hardwood treads / risers, box stairs, WALLS 2 SIDES, balusters/handrail, newel post <input type="checkbox"/> Hardwood treads / risers, box stairs, balusters/handrail, newel post <input type="checkbox"/> Curved stairway (hardwood), open 1 side </div> <div style="width: 30%;"> <input type="checkbox"/> Pine treads/risers, box stairs, WALLS 2 SIDES/handrail only <input type="checkbox"/> Pine treads/risers, box stairs, balusters/handrail, newel post <input type="checkbox"/> Curved stairway (hardwood), open 2 sides </div> <div style="width: 30%;"> <input type="checkbox"/> Attic stair; folding; pine; 8'-6" <input type="checkbox"/> Spiral stairs, oak <input type="checkbox"/> Spiral stairs, metal </div> </div> | | | |

FIGURE 3

| P CODE | CITY | STATE | Regional Adjustment Factor | Winter Design Temp | | Deg Days | Deg Days | Sales Tax | Sub GC | Escalation |
|--------|------------|-------|----------------------------------|--------------------|-------|---------------|---------------|-----------|--------|------------|
| | | | | 99% | 97.5% | Heating DD | Cooling DD | Tax Rate | 2% | 1.50% |
| 35000 | Cullman | AL | 0.85 | 17 | 21 | 2,823 | 1,881 | 4% | | |
| 35200 | Birmingham | AL | 0.86 | 17 | 21 | 2,823 | 1,881 | 4% | | |

FIGURE 4

2002 Project Planning & Management, Inc.
TOTAL FINISHED AREA (TFA): 4,778 SF
Berrien City, MI
TOTAL CONSTRUCTED AREA: 8,358 SF
4 Bedroom; 5 Bath

| Enter: | State | Residential Energy Code | State Mandate | Comments |
|--------|----------|--|---------------|--|
| MI | Michigan | Michigan Uniform Energy Code Part 10 Rules, less stringent than 1992 MEC | Yes | Prior to June 22, 1977, the state of Michigan had no building energy efficiency requirements. On July 27, 1985, the state adopted ANSI/ASHRAE/IES Standard 90A-1980 statewide. SB 719, signed in early January 1996, repealed the 1995 adoption of the 1993 MEC. The legislation directed the state construction code commission to, by April 1, 1997, provide cost-effective standards and establish a program to provide home buyers with energy rating information. The Michigan Uniform Energy Code Part 10 Rules were adopted March 31, 1999. |

Envelope Heat Loss

| | Area (SF) | R-Value | U Factor | Delta T | Heat Loss (BTUH) |
|---|-----------|---------|----------|---------|--------------------|
| Heat Loss-Basement Walls | 1,621 | 6 | 0.16 | 22 | 6,359 |
| Heat Loss-Basement Floor (or Ground Flr Slab) | 3,198 | 25 | 0.04 | 22 | 2,814 |
| Heat Loss-Walkout Wall | 1,500 | 14 | 0.07 | 69 | 7,555 |
| Heat Loss-Walls | 448 | 14 | 0.07 | 69 | 2,206 |
| Heat Loss-Windows (low-E) Default (R-3) | 585 | 3 | 0.33 | 69 | 13,455 |
| Heat Loss-Windows Standard Glazing (R-2) | 0 | 2 | 0.50 | 69 | - |
| Heat Loss-Windows (low-E) Triple Glaze (R-6) | 0 | 6 | 0.17 | 69 | - |
| Heat Loss-Doorwalls | 126 | 3 | 0.33 | 69 | 2,898 |
| Heat Loss-Doorwalls | 0 | 3 | 0.33 | 69 | - |
| Heat Loss-Doors | 84 | 5 | 0.20 | 69 | 1,159 |
| Heat Loss-Roof SIP (on Timber) | 1,283 | 36 | 0.03 | 69 | 2,439 |
| Heat Loss-Roof SIP (on SIP) | 0 | 0 | 0.00 | 69 | - |
| Heat Loss-Attic (Uninsulated Roof Rafters) | 547 | 16 | 0.06 | 69 | 2,383 |
| Heat Loss-Skylights | 0 | 3 | 0.33 | 69 | - |
| Building Envelope Heat Loss | | | | | 41,260 BTUH |

3 97.5%-99% Design Dry Bulb Temp (deg F)

72 Indoor Design Temp (deg F)

69 Delta T

72,113 Total BTUH Demand

1.4 Furnace Sizing Factor

127,000 Furnace Size at 80%

Meets Energy Star:

113,000 Furnace Size at 90%

108,000 Furnace Size at 94%

101,000 Furnace Size at 100% (ELECTRIC)

Envelope Tightness

Select > 4 Energy Star Very Tight 0.25 ACH (Air Changes / Hour) Design Occupancy: 5

Infiltration / Ventilation

| | CFM | ACH | Constant | Volume | Delta T | Heat Loss (BTUH) |
|-------------------------------|-----------------------|------|----------|--------|---------|------------------|
| Natural Infiltration | 303 | 0.25 | 1.08 | 72,764 | 69 | 22,593 |
| Mechanical Ventilation w/AAUX | 424 | 0.35 | 1.08 | 72,764 | 18 | 0,251 |
| 75% AAUX Efficiency | 141.09 Min Target CFM | | | | | |

Envelope + Infiltration Heat Loss = 72,113 BTUH

Furnace AFUE = 90% 2 <Select Furnace Eff.

Furnace Size = 80,126 BTUH

D = Degree Days = 6,439 Berrien City, MI (per National Climatic Data Center)

T = Temp diff = 69 degrees

V = Fuel value = 1,052 BTUh per cu ft natural gas

V = Fuel value = 91,743 BTUh per Gallon propane

V = Fuel value = 3,413 BTUh per KWH electric

CF1 = 1.35 Correction factor that includes the effects of rated full load efficiency, part load performance, over sizing and energy conservation devices.

CF2 = 0.71 Empirical correction factor for heating effect versus 65 degrees F degrees-days.

E = Annual Energy Consumption =

164,715 cu ft natural gas \$0.58 cost per therm NGAS

1,889 gallons of propane \$0.0058 cost per CF of nat gas

- KWH of electricity (100% Efficiency) \$0.95 cost per gallon Propane

\$0.075 cost per KWH of Electricity (Assumes Average Off Peak and Peak)

Annual Heating Cost = \$955.35 NGAS

Annual Heating Cost = \$1,794.32 PROPANE

Annual Heating Cost = \$0.00 ELECTRIC

FIGURE 5

| HOME SPECIFIC QUALITY / COST SELECTIONS | | | | | MASTER (BASELINE) RCM | | P21 | | | |
|---|---|---|--|--|---|-------|---------|----------|----------------|---------|
| 237 System Selections © 2002 Project Planning & Management, Inc. | | | | | Barron City, MI 4 Bedroom, 5 Bath | | | | | |
| Selection Switches | | | | | TOTAL FINISHED AREA: 4,778 SF TOTAL CONSTRUCTED AREA: 9,359 SF | | | | | |
| SYSTEM | SUBSYSTEM | | | | quan | unit | unit \$ | total \$ | BASELINE TOTAL | Savings |
| 01 Foundation | 011 Standard Foundations | | | | | | | | | |
| | 011.10 Spread footings (timber columns) | 1 | 12" thick-30"x30"; forms, rebar, concrete | | 9 | NCOLS | \$46.61 | \$419 | \$419 | \$0 |
| | 011.10 Spread footings (tally columns) | 1 | 12" thick-30"x30"; forms, rebar, concrete | | 5 | EA | \$46.61 | \$233 | \$233 | \$0 |
| | 011.20 Spread footings (foundation walls) | 4 | 12" thick x 24" wide; forms, reinf, direct chute | | 43 | LF | \$13.53 | \$582 | \$582 | \$0 |
| | 011.20 Spread footings (basement walls) | 5 | 12" thick x 24" wide; forms, reinf, direct chute, PVC 6" gravel drained | | 352 | LF | \$18.47 | \$6,506 | \$6,506 | \$0 |
| | 011.30 Foundation Wall (4' high) | 1 | Poured-8"; bitum/damp; sill plates | | 230 | LF | \$20.17 | \$4,640 | \$4,640 | \$0 |
| | 011.40 Excavation: Foundation Wall Footing | 2 | 4' depth spread ftg excav, sand/gravel; backfill; no compact'n; rough grade | | 345 | SF | \$9.39 | \$136 | \$136 | \$0 |
| | 012 Special Foundations | 1 | No additional special foundations | | 345 | SF | \$9.00 | \$0 | \$0 | \$0 |
| 02 Substructure | 021 Slab on Grade | | | | | | | | | |
| | 021.00 Ground Floor Slab on Grade | 3 | Not Used | | 0 | SF | \$0.00 | \$0 | \$0 | \$0 |
| | 021.00 Garage Floor Slab on Grade | 1 | 4" slab w/4" gravel base; 6 mil vap; expan mat'l; W1.4W1.4; steel trowel finis | | 864 | SF | \$2.69 | \$2,328 | \$2,328 | \$0 |
| | 021.00 Basement Slab on Grade | 3 | 4" slab w/4" gravel base; 6 mil vap; expan mat'l; W1.4W1.4; steel trowel finis | | 3,198 | SF | \$2.69 | \$8,617 | \$8,617 | \$0 |
| | 021.10 Basement Slab Insulation | 1 | Not Used | | 0 | SF | \$0.00 | \$0 | \$0 | \$0 |
| | 022 Excavation: Basement | 3 | Walkout: Sand & gravel excav, backfill; compaction 8" fill; rough grade | | 1,066 | CY | \$5.75 | \$6,125 | \$6,125 | \$0 |
| | 022.00 Off Site Trucking | 1 | Assumes off-site hauling NOT required (Assumes on site placement of spoils) | | 0 | CY | \$0.00 | \$0 | \$0 | \$0 |
| | 023 Basement Walls | 1 | Poured-8"; bitum/damp; sill plates | | 1,821 | BWA | \$5.30 | \$9,643 | \$9,643 | \$0 |
| | 023.00 Partial Height Basement Wall Framing | 1 | Not Used | | 0 | BWA | \$0.00 | \$0 | \$0 | \$0 |
| | 023.10 Basement Wall Insulation | 1 | None | | 1,821 | BWA | \$0.00 | \$0 | \$0 | \$0 |

Baseline Selections

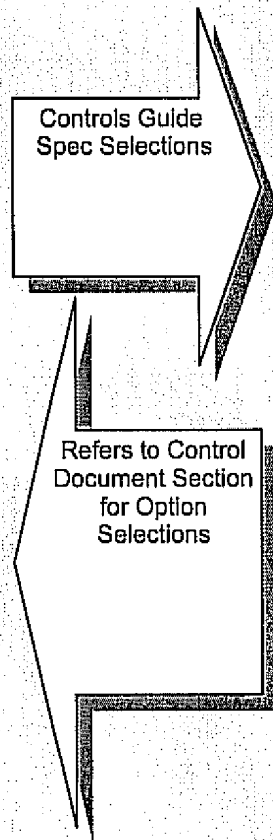
| HOME SPECIFIC QUALITY / COST SELECTIONS | | | | | MASTER (BASELINE) RCM | | P21 | | | | |
|---|--|--|--|--|----------------------------------|--|-------------------|----------|----------------|----------|-----------------|
| 237 System Selections | | | | | TOTAL FINISHED AREA: 4,770 SF | | Barron City, MI | | | | |
| © 2002 Project Planning & Management, Inc. | | | | | TOTAL CONSTRUCTED AREA: 8,359 SF | | 4 Bedroom, 5 Bath | | | | |
| Selection Switches | | | | | | | | | | | |
| SUBSYSTEM | | | | | quan | unit | unit \$ | total \$ | BASELINE TOTAL | Savings | |
| 01 Foundation | | | | | | | | | | | |
| 011 Standard Foundations | | | | | | | | | | | |
| 011.10 Spread footings (timber columns) | | | | | 1 | 12" thick-30"x30"; forms, rebar, concrete | 9 | NCOLS | \$46.61 | \$419 | \$0 |
| 011.10 Spread footings (tally columns) | | | | | 1 | 12" thick-30"x30"; forms, rebar, concrete | 5 | EA | \$46.61 | \$233 | \$0 |
| 011.20 Spread footings (foundation walls) | | | | | 4 | 12" thick x 24" wide; forms, reinf, direct chute | 43 | LF | \$13.53 | \$582 | \$0 |
| 011.20 Spread footings (basement walls) | | | | | 5 | 12" thick x 24" wide; forms, reinf, direct chute, PVC 6" gravel drained | 352 | LF | \$18.47 | \$6,506 | \$0 |
| 011.30 Foundation Wall (4' high) | | | | | 1 | Poured-8"; bitum/damp; sill plates | 80 | LF | \$20.17 | \$1,614 | (\$3,026) |
| 011.40 Excavation: Foundation Wall Footing | | | | | 2 | 4' depth spread ftg excav, sand/gravel; backfill; no compact'n; rough grade | 195 | SF | \$9.39 | \$77 | \$136 (\$59) |
| 012 Special Foundations | | | | | 1 | No additional special foundations | 195 | SF | \$0.00 | \$0 | \$0 |
| 02 Substructure | | | | | | | | | | | |
| 021 Slab on Grade | | | | | | | | | | | |
| 021.00 Ground Floor Slab on Grade | | | | | 3 | Not Used | 0 | SF | \$0.00 | \$0 | \$0 |
| 021.00 Garage Floor Slab on Grade | | | | | 1 | 4" slab w/4" gravel base; 6 mil vap; expan mat'l; W1.4W1.4; steel trowel finis | 864 | SF | \$2.69 | \$2,328 | \$0 |
| 021.00 Basement Slab on Grade | | | | | 3 | 4" slab w/4" gravel base; 6 mil vap; expan mat'l; W1.4W1.4; steel trowel finis | 3,190 | SF | \$2.69 | \$8,617 | \$0 |
| 021.10 Basement Slab Insulation | | | | | 1 | Not Used | 0 | SF | \$0.00 | \$0 | \$0 |
| 022 Excavation: Basement | | | | | 3 | <RESELECT> Must Select '1' or 2-Full Basement Option | 1,066 | CY | <RESELECT> | #VALUE! | \$6,125 #VALUE! |
| 022.00 Off Site Trucking | | | | | 1 | Assumes off-site hauling NOT required (Assumes on site placement of spoils) | 0 | CY | \$0.00 | \$0 | \$0 |
| 023 Basement Walls | | | | | 1 | Poured-8"; bitum/damp; sill plates | 3,171 | BWA | \$5.30 | \$16,792 | \$9,643 \$7,149 |
| 023.00 Partial Height Basement Wall Framing | | | | | 1 | Not Used | 0 | BWA | \$0.00 | \$0 | \$0 |
| 023.10 Basement Wall Insulation | | | | | 1 | None | 3,171 | BWA | \$0.00 | \$0 | \$0 |

Alternate Selections illustrating self documenting line item changes to component costs and Self-Correcting feature (Line 022 Basement Excavation) wherein "ERROR" was triggered when "Walkout Basement" was deselected in '40 Design Characteristics, requiring selection of Full Basement excavation options.

FIGURE 6

**Residential Cost Estimation
Construction Summary
"Component Options"**

- **Control Document** that provides outline construction descriptions of the building systems as selected by the Owner.
- **Serves a similar purpose as site and engineering drawings** would provide in that scope and construction requirements are called out for site, structural, mechanical, electrical and plumbing systems.
- Controls which material options are to be selected in cases where options exist in the guide spec sections.



**Guide Specifications
CSI MASTERFORMAT
Divisions 1-16**

- **Detailed Guide Specifications including all 16 CSI Divisions**
 - Division 1 - General Requirements
 - Division 2 - Site Construction
 - Division 3 - Concrete
 - Division 4 - Masonry
 - Division 5 - Metals
 - Division 6 - Wood And Plastics
 - Division 7 - Thermal And Moisture Protection
 - Division 8 - Doors And Windows
 - Division 9 - Finishes
 - Division 10 - Specialties
 - Division 11 - Equipment
 - Division 12 - Furnishings
 - Division 13 - Special Construction
 - Division 14 - Conveying Systems
 - Division 15 - Mechanical
 - Division 16 - Electrical

FIGURE 7